DRAFT

IPP

INTERMOUNTAIN POWER PROJECT

April 7, 1983

Mr. Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee
State of Utah
P.O. Box 250
Salt Lake City, Utah 84100

Dear Mr. Bradford:

Intermountain Power Project (IPP) Plan Review
Request for More Information

This is in response to your September 3, 1982 letter requesting information concerning the IPP plant design and operating procedures. Enclosure 1 of this letter consists of responses to your concerns and to questions raised by a member of your staff in a follow-up telephone conversation.

On December 3, 1980, the State of Utah Department of Health (DOH) issued an air quality approval order to the IPP for the construction and operation of a power plant at the Lynndyl site. That order contains certain provisions and conditions that must be met in the operation of the IPP. It also calls for the IPP to file with the DOH copies of materials filed with the United States Environmental Protection Agency (EPA).

The IPP has filed with EPA and the DOH unsigned copies of contract agreements relevant to the construction of the emission control equipment for IPP. Signed copies of these contracts are now available and are enclosed for your records. Please note that these contracts contain no changes of significance to the control equipment design or performance. Enclosure 2 of this letter is Contract No. 2010N, Boiler Units (NOx control system); Enclosure 3 is Contract No. 62.0203, Fabric Filters (particulate matter control system); and Enclosure 4 is Contract No. 62.0202, Flue Gas Wet Scrubber (SO_2 control system). Enclosure 5 is Change Order No. 003 to Contract No. 62.0202, which is the only Change Order to date that provides for a significant change of control equipment design or performance.

Based on information in the previously submitted unsigned contracts, the DOH in the September 3, 1982 letter questioned whether total emissions at the IPP Lynndyl site would be more than those on which the 1980 DOH approval order was based, and suggested that State proceedings to modify the terms and conditions of the 1980 order might be required. As discussed below, total emissions from the project will be substantially less than those authorized in 1980 because on March 31, 1983 the size of the project was officially reduced from four to two generating units. As to the remaining two generating units, refinements have been made in their design, but none of these refinements will affect the IPP's ability to comply with the terms and conditions of the 1980 approval order. In sum, the current design of the project will result in substantially less emissions and air quality impacts than those evaluated when this project was granted an approval order to construct and operate in 1980. IPP is thus not making any changes which will "increase the amount or change the effect of, or the character of, air contaminants discharged" (Utah Air Conservation Regulations (UACR) Section 3.1.1) so as to create "air pollution" (i.e., conditions "injurious to human health or welfare, animal or plant life or property," UACR, Section 1.1.10). The referenced changes do not constitute major modifications of the source and, therefore, do not trigger additional Prevention of Significant Deterioration review under UACR, Section 3.6.

The H. E. Cramer Company, Inc., has recently completed a computer modeling analysis for both stack and fugitive emission impacts for the current two-generating unit design. Their report containing the method of analysis and the emission impact results will be submitted to you when it is finalized. Results of this analysis are summarized in Enclosure 1.

The information in this letter and its enclosures demonstrates that the refinements in IPP design (which include reduction in the number of generating units) will not result in any increases in the amounts or effects of air contaminants from the IPP site. We assume that the time periods set forth in UACR, Section 3.1.2, will begin on the date of receipt of this transmittal insofar as it completes the information required for approval of an Amended Notice of Intent covering the changes in the emission control equipment and the downsizing of the project.

If you or your staff require any additional information, please contact me or Mr. Roger T. Pelote at (213) 481-3412.

Sincerely,

JAMES H. ANTHONY
Project Director
Intermountain Power Project

Enclosures

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Enclosure 1

Response to the Items Listed in the DOH's
September 3, 1982 Letter and Follow-up Telephone Conversation

Your letter raised eight issues about the construction and operation of the IPP. The following paragraphs respond to each of those issues and to additional questions raised by a member of your staff in a subsequent telephone conversation.

1. Size of Units at the Lynndyl Site

Item 1 of your letter suggests that the proposed boiler size at the Lynndyl site will result in emission increases that will necessitate not only additional air quality modeling, but also the issuance of a modified permit following "all the procedural steps that issuing a new permit entails". For the reasons discussed below, the IPP is not making any change that increases emissions above those authorized by the project air quality approval order.

The IPP was recently decreased in size from four to two generating units. Previous air quality impact studies were based on a four-unit project with each unit having a nominal rating of 750 megawatts net which corresponds to a boiler heat input of 7.493×10^9 BTU/hour. Although neither the boiler design nor the estimated nominal rating of the units has changed significantly, the standard utility practice of designing the major power plant components with a conservative margin of safety and providing steam for auxiliary uses has resulted in units that will have a boiler heat input as high as 8.352×10^9 BTU/hour. These units will comply with all conditions of the air quality approval order.

The H. E. Cramer Company, Inc., has recently completed a new air quality impact study using the boiler heat input value of 8.352×10^9 BTU/hour for the two-unit project. The results of this study show that emissions and air quality impacts will be substantially reduced from those previously projected for the four-unit project; therefore, we believe that formal modification of the air quality approval order is inappropriate.

The pollutant emissions from the two-unit IPP using the boiler heat input value of 8.352×10^9 BTU/hour are compared to the previous four-unit IPP emissions using the boiler heat input of 7.493×10^9 BTU/hour in the table below. The emissions for particulate matter (PM) are stack emissions only. These values were used in the air quality impact study.

	Total Emission Rate in Grams/Sec			
	April 1983 Two Units		June 1981 Four Units	
Pollutant	24-Hour Period	Annual Average	24-Hour Period	Annual Average
SO_2	316.0	268.0	584.8	497.0
PM (stack)	42.2	35.8	74.8	63.6
NOx	Not Applicable	1,157.6	Not Applicable	2,247.4

The projected pollutant impacts from the two-unit IPP and a comparison to the previous four-unit IPP, the applicable Prevention of Significant Deterioration (PSD) increments and National Ambient Air Quality Standards (NAAQS) are given below. The impacts for PM include impacts for both stack and fugitive emissions.

Pollutant	Applicable Averaging Time	Allowable Class II PSD Increment (ug/m^3)	NAAQS (ug/m^3)		IPP Impacts (ug/m^3)	
			Primary	Secondary	April 1983 Two Units	June 1981 Four Units
SO_2	3 hours	512	None	1,300	70	143
	24 Hours	91	365	None	27	61
	Annual	20	80	None	0.88	2.12
PM	Annual	19	75	60		18.6
NOx	Annual	None	100	100	3.80	9.60

2. Operation Curtailment During Breakdown/ Malfunction of Pollution Control Equipment

Section 4.7 of the Utah Air Conservation Regulations (UACR) provides that excessive emissions resulting from the unavoidable breakdown of equipment or procedural errors will not be deemed a violation of DOH regulations. However, violations caused entirely or in part by preventable upset conditions of preventable equipment breakdown are not to be considered unavoidable breakdowns. As noted in Item 2 of your letter, Section 4.7 also requires operation curtailment during breakdown/malfunction of pollution control equipment to a level commensurate with air control capacity.

Your letter refers to the IPP contract term that calls for bypassing the baghouse and SO_2 scrubber in the event of excess temperature at the baghouse inlet, excessive pressure drop in the baghouse, excessive pressure at the inlet to the baghouse and electrical system failure. The letter then requests that IPP submit details of its breakown/malfunction operating procedures to allow the DOH to determine if those procedures will ensure compliance with UACR, Section 4.7.

The IPP is being planned for full compliance with UACR, Section 4.7, during operation of the plant and will have operating procedures that will ensure compliance with Section 4.7 during the breakdown/malfunction events that you cited in your letter. Summarized below is what the IPP intends to do to meet the requirements of Section 4.7 during the breakdown/malfunction events you cite.

Your letter suggests that the breakdown/malfunction events about which you are concerned will lead to bypassing both the SO_2 scrubbers and the baghouse. Actually, the events cited in your letter will <u>not</u> result in bypassing the SO_2 scrubbers. The flue gas wet scrubbers contract now provides only for a bypass of up to 25 percent of the flue gas for Unit 1 and no bypass of the flue gas scrubbers for Unit 2 as shown in Enclosure 5.

The 25 percent bypass is being installed around the Unit 1 flue gas wet scrubber because of construction scheduling considerations in the event of a delay in the erection activities of the wet scrubber.

This 25-percent bypass is intended to be used during initial ambient air testing of the forced draft (FD) fans and the induced draft (ID) fans and during the chemical boilout of the boiler. These fan tests and boiler boilout may occur before the erection of the wet scrubber is completed. After the initial fan testing and boiler boilout, the 25-percent bypass damper around the Unit 1 flue gas wet scrubber will be closed. The IPP does not intend to bypass the SO_2 scrubbers after commercial start-up of the plant.

Since the SO_2 scrubbers will not be bypassed, the following paragraphs summarize only the baghouse bypass to ensure compliance with Section 4.7 of the UACR. Essentially, the IPP will be bypassing the baghouse only long enough to correct the cause of the problem. If the problem cannot be solved in a short period of time, the unit will be safely shut down or load limited.

The SO_2 scrubbers will be in operation prior to operation of the boiler units and will remove a substantial amount of PM whenever the bagouse is bypassed. The SO_2 scrubbers also have two four-pass mist eliminators and flue gas reheaters to reduce opacity and PM emissions.

a. Excessive Temperature at the Baghouse Inlet

You indicated concern about bypassing the baghouse in the event of excess temperature at the baghouse inlet. Continuous operation of a unit with excessive flue gas temperature would cause the boiler to malfunction, could cause deterioration of the bags in the baghouse, and could cause extensive damage to the induced draft fans, the wet scrubber, the chimney liner, and the interconnecting ductwork. In case of excessive temperature at the baghouse inlet, the baghouse will be bypassed to protect the bags from deteriorating and the boiler will be shut down or load limited as quickly as possible as required by Section 4.7 of the UACR. This will limit or minimize any damage to the boiler and to the equipment downstream of the four air heaters.

b. Excessive Pressure Drop in the Baghouse.

You requested us to note the bypass procedures to be used in the event of an excessive pressure drop in the baghouse. This malfunction could occur due to problems associated with the baghouse cleaning cycle. The baghouse will be bypassed to avoid fabric filter damage and the boiler will be shut down as quickly as possible if this problem cannot be corrected as required by Section 4.7 of the UACR.

c. Excessive Pressure at the Inlet to the Baghouse

You asked that we indicate the baghouse bypass procedures to be used if there is excessive pressure at the inlet to the baghouse. This condition will occur only if a boiler explosion occurs or if the boiler gas path is restricted with the FD fans in service. These conditions are dangerous, unavoidable breakdown situations in which the boiler must be safely shut down as quickly as possible. The baghouse bypass dampers will be opened in these breakdown situations to allow a gas path from the boiler and to avoid permanent structural damage to the baghouse as required by Section 4.7 of the UACR.

d. Electrical System Failure

Finally, you asked for the baghouse bypass procedures to be used in case of an electrical system failure. If the sources of control power are lost for the whole generating unit, the boiler will shut down to prevent a boiler explosion. This situation is considered an unavoidable breakdown as provided for by Section 4.7 of the UACR. If the sources of control power are lost only to the baghouse programmable controllers, then a backup source of power is automatically brought into service. If this system also fails, the fabric filter is designed to go into bypass to allow a safe shutdown.

3. Scrubber Operation Under Positive Pressure

Item 3 of your letter notes that our scrubber contract calls for the SO_2 scrubber to be designed for operation under

positive pressure. You have indicated that the DOH normally considers negative pressure operation to be Best Available Control Technology (BACT) because that may reduce SO_2 emissions from leaks in the scrubber shell and ductwork. You then asked if the IPP scrubber design could be changed to provide for negative pressure operation and whether that would add an excessive cost to the project.

The SO_2 scrubber originally proposed and approved in the air quality approval order was designed for operation under positive pressure. The present design has been somewhat refined but retains the positive pressure feature.

The proposed system will assure compliance within the permit terms and, for this reason alone, would be considered BACT under EPA's PSD regulations. The IPP believes that its positive pressure scrubber system is BACT and a better technology than a negative pressure scrubber system for reasons discussed below.

A negative pressure scrubber system requires that the ID fans be placed downstream of the scrubber. Even when reheated, the treated flue gas from the SO_2 scrubbers would deposit debris on ID fans downstream of the scrubbers which would cause corrosion and severe vibration. This corrosion and severe vibration would diminish the availability of the ID fans which would diminish the availability of the generating units. A cost of approximately $400 million in replacement power would result from each percent of unavailability of the units. For this reason, the SO_2 scrubber system was designed to minimize the amount of downstream ductwork and equipment.

A design change in ID fan location to make a change from positive to negative pressure in the SO_2 scrubbers cannot practicably be made due to the advanced stage of the contractual agreement between IPP and the manufacturer. Any changes to these contracts will result in excessive costs and delays to IPP due to renegotiation and redesign. Each day of delay would result in an additional cost of approximately $2 million.

We wish to point out that we do not plan to operate the SO_2 scrubber system if there is a significant leak. This is primarily for reasons of personnel safety. Since the scrubbers and ductwork will be of gas-tight construction, and since the SO_2 scrubber modules at IPP will be located within an enclosed building, any leaks which might develop will be quickly detected and corrected. Also, since the scrubber consists of six independent modules, each with a "mansafe" flue gas inlet and outlet damper, and since two of the six modules are spares, on-line scrubber maintenance will be performed when needed.

4. Change From Lime to Limestone Scrubber

Item 4 of your letter points out that the original plant design called for use of a lime SO_2 scrubber but that the

IPP's contract now calls for the installation of a limestone SO_2 scrubber. You stated that the design change might create a change in the materials handling systems, fugitive dust controls, fugitive dust emission rates, and amount of sludge created. You then indicate that you require that modeling be done for any emission changes and that you require that design specifications be submitted for review.

The IPP has completed a fugitive emissions system analysis due to design changes in the materials handling systems and fugitive emission controls. The design change from lime to limestone handling, a change in the quantity of sludge created for disposal, and design changes in coal handling have been included in this analysis. The fugitive emissions were modeled with the stack emissions for air quality impacts and are given as the PM impact in the emissions impact table included in the response to question 1 of your letter. As you can see, the PM impact is well below the applicable standards.

The control technology and control efficiencies for these emissions are equal to or better than those approved as BACT by the DOH and EPA during the IPP permit application review and should, therefore, be considered BACT.

5. Baghouse Filter

Item 5 of your letter indicates that page 2A-17 of the baghouse contract states that the filter is not required to meet performance specifications at maximum flow. You asked us to clarify this statement and explain how the baghouse filter would operate at levels necessary to meet State and Federal law.

The IPP will comply with State and Federal regulations at all boiler performance flow rates. The maximum flow that is defined in the fabric filter specifications and referenced in Section 2A.5.6 is a flow rate that is in excess of any condition that is anticipated, and is used for structural limitation purposes only.

Section 2A.7, PERFORMANCE GUARANTEE, states that the baghouse will meet the permit emission and opacity limits for 100 percent of the value listed in Article 2A.5.5, Design Flow Conditions. An 8.352×10^9 BTU/hour heat input to each boiler will not create flow greater than design flow conditions.

6. Compliance Testing

Item 6 of your letter requests that, in order to avoid disputes over compliance testing, the IPP should provide more detailed information (a) concerning the location of compliance emission monitors; (b) specifying whether the IPP's calculations of baghouse filter flow measurement will be consistent with EPA Methods 1-5 or 17; (c) confirming that any particulates carried through the scrubber mist eliminator into the stack and captured in the sampling train are to be included in the compliance demonstration for particulate mass emission rate; and

(d) confirming that, during performance tests, soot blowing of boiler and economizer and stack gas reheat tubes must be representative of normal operations.

Detailed plans showing location of Compliance Emission Monitors (CEMs) are currently being prepared. The plans will be submitted to you as they become available and at least 30 days prior to commercial operation of the first boiler. CEMs will be located in the stack at an elevation greater than eight flue diameters above the breaching. In addition, CEMs will be located downstream of the SO_2 scrubber.

Compliance demonstration tests to be submitted to you and the EPA will use EPA Methods 1-5 or 17 and use only the measured value of flow rate. These compliance tests will be made at approved DOH and EPA duct and stack locations. These tests will be made at the same time as the performance guarantee tests.

The performance guarantee tests are for contractual guarantees between the owner and the manufacturer only. Nevertheless, the performance guarantee tests will use EPA Methods 1-5 or 17; the gas flow for those tests shall be taken as the arithmetic average of the experimentally measured flow; and the calculated stoichiometric flow will be adjusted for excess combustion air. The performance guarantee test data will not be used for compliance testing.

Particulates captured in the sampling train will be included in the compliance demonstration tests for particulate mass emission rate as specified in the appropriate EPA testing procedures.

During the compliance demonstration tests, soot blowing of boiler, economizer and stack gas reheat tubes will be representative of normal operation.

7. Post-Construction Ambient Air Monitoring

Item 7 of your letter reminds us that the IPP must conduct post-construction ambient air monitoring and requires the IPP to submit a detailed monitoring plan before any monitoring is done.

The IPP will comply with the DOH and EPA requirements for post-construction ambient air monitoring. The IPP will provide you and EPA with a detailed monitoring plan for approval as it becomes available and at least 30 days before commercial operation of the first boiler.

8. IPP Decision to Build Only Two Units at This Time

Item 8 of your letter notes that if the IPP decides to build only two units at this time, then the existing approval order covering the other two units would have to be reevaluated if and when the IPP decided to proceed on those two units.

On March 31, 1983, the IPP decided to build only two units at the Lynndyl site. Since the construction of only two units will lead to emission decreases at the site, no modification of the current approval order is necessary to accommodate the reduction in project size.

If, in the future, the IPP decides to proceed with Units 3 and 4, it will make appropriate application to the DOH with the required supporting information.

9. Responses to Questions Raised by Mr. David Kopta

In an October 13, 1982 telephone conversation with our Mr. Stephen Clark, Mr. David Kopta of your office asked if the IPP will have a water treatment facility which will result in an increase in fugitive emissions due to disposal of water treatment sludge. Mr. Kopta indicated that any such increase in fugitive emissions would have to be included in a modeling analysis of fugitive emissions.

The IPP will have a water treatment facility. Lime will be transported by truck (approximately two to four deliveries per month) to lime storage silos (no lime piles). The lime will be pneumatically transported to the water treatment facility. When the facility operates, the waste liquid that is generated will be piped to the SO_2 scrubber. Since there will not be any truck transport of a wet material and since truck transport of lime is minimal, there will be negligible fugitive emissions as a result of the water treatment facility. Thus, no fugitive emissions modeling analysis should be required as a result of the operation of the water treatment facility.